

Mathematics and Associated Teaching Methods II

GEOMETRY CIRCLE

Degree in Primary Education Teaching

School year 2017-2018

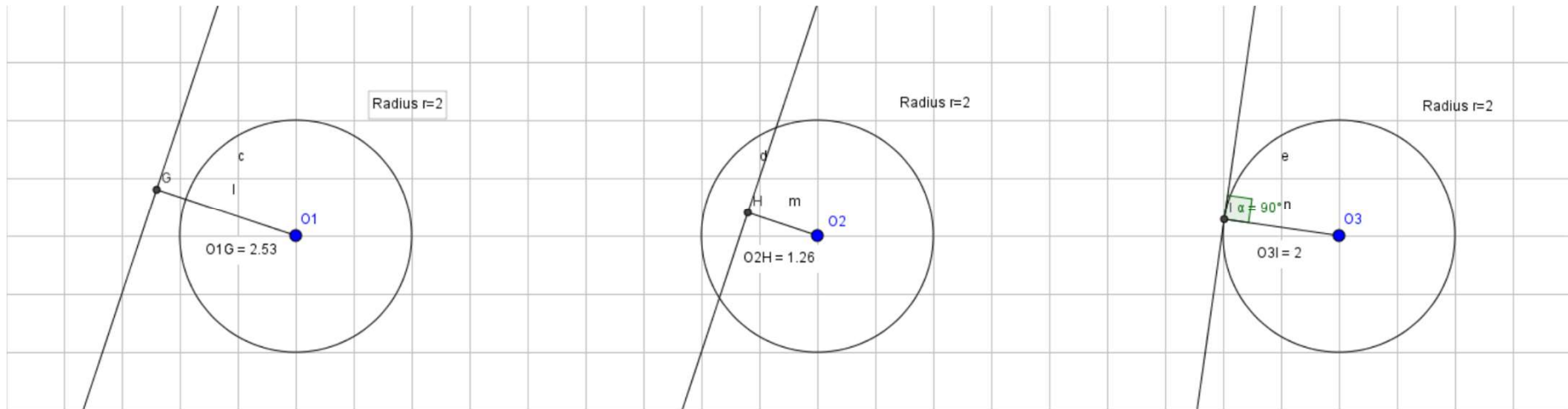
Itziar García Honrado

Basic Definitions

- Circle vs. Circumference
- Elements:
 - ❖ Radius.
 - ❖ Arc.
 - ❖ Diameter.
 - ❖ Semicircumference.
 - ❖ Arc segment. (It is **not** the straight line between two end points of an arc. It is the part of a circle bounded by an arc and the straight line between the its two end points)
 - ❖ Arc sector.

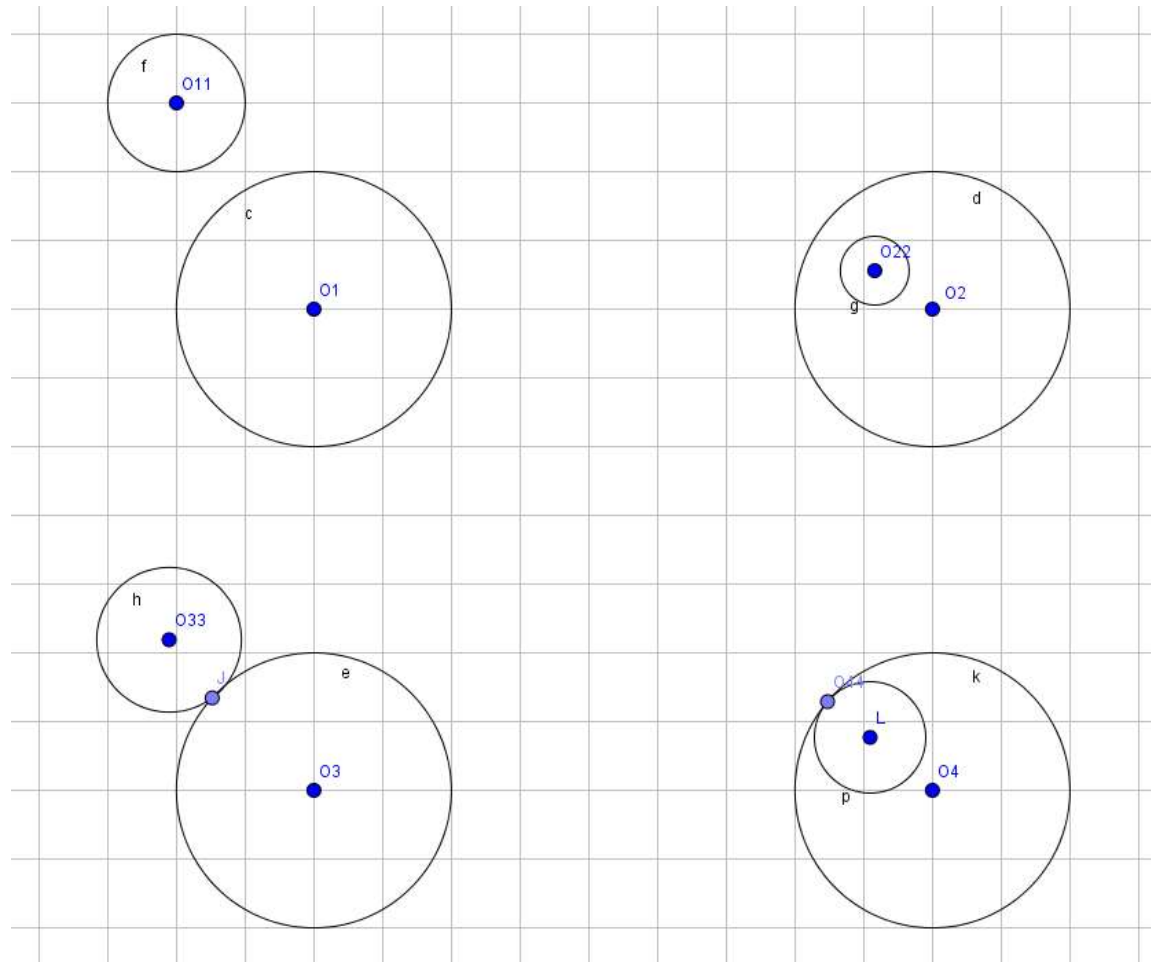
Relative positions

- Relative positions of an straight line and a circumference:
 - ❖ Exterior (or disjoint)
 - ❖ Interior (two intersection points)
 - ❖ Tangent (one intersection point)

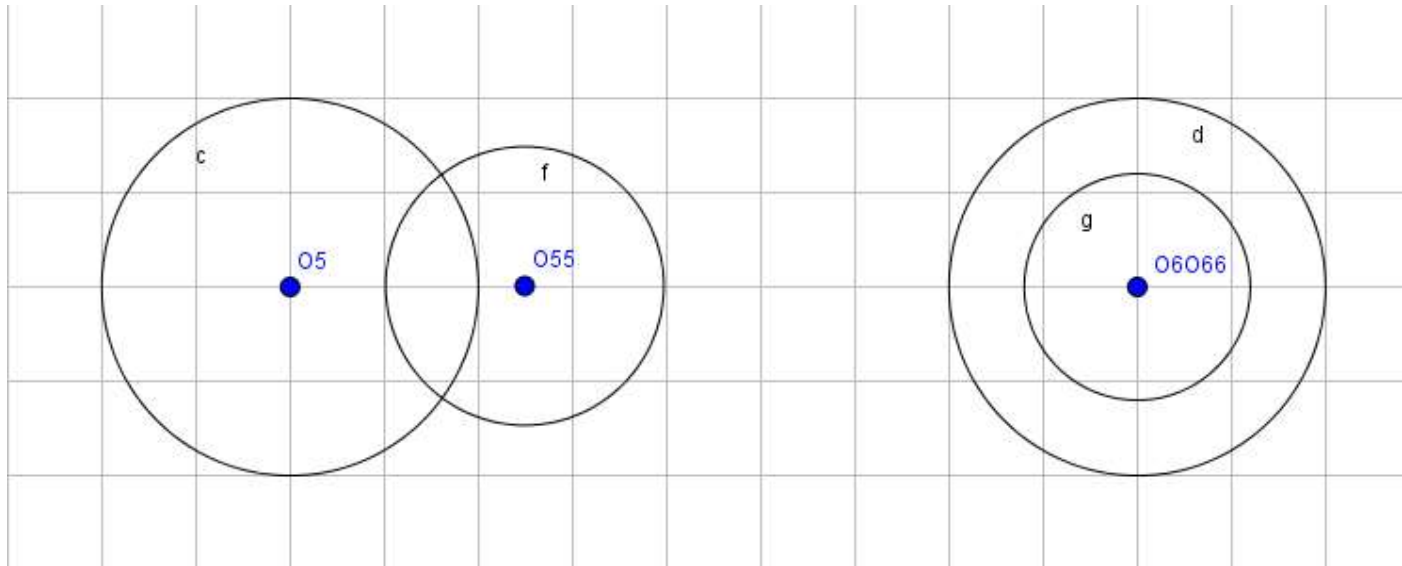


Relative positions

- Relative positions of two circumferences:



Relative positions



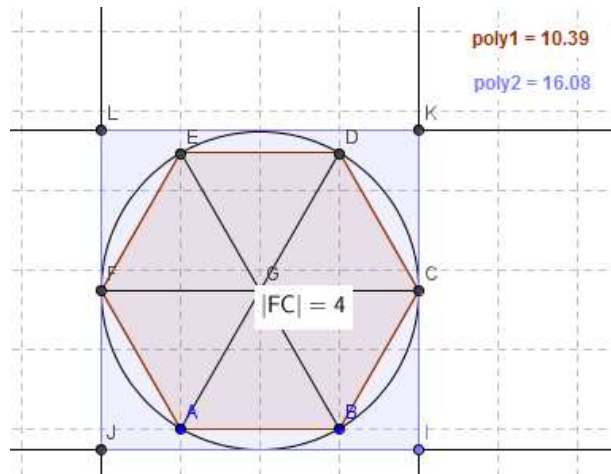
- Exterior/ interior
- Tangent exterior/interior
- Two intersection points
- Concentric

Longitude of a circumference

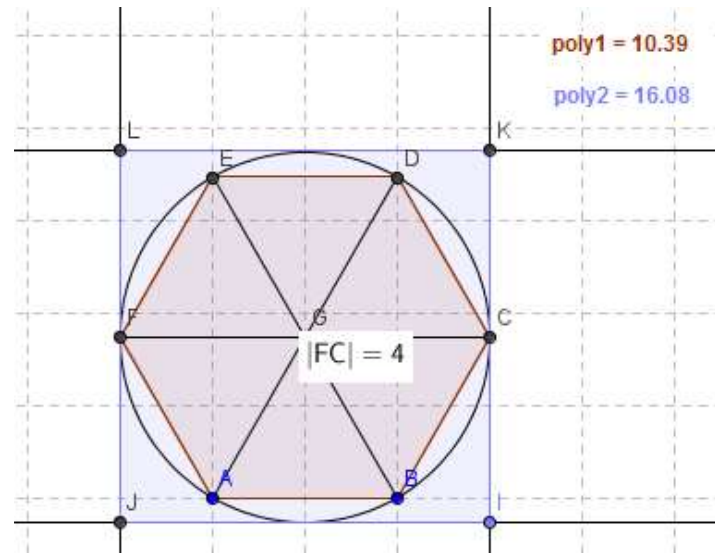
Empirical demonstration

- circumference measured with a rope
- diametre

Deductive demonstration:



Longitude of a circumference



inscribed polygons < Longitude < circumscribed polygons

Angles in a circumference

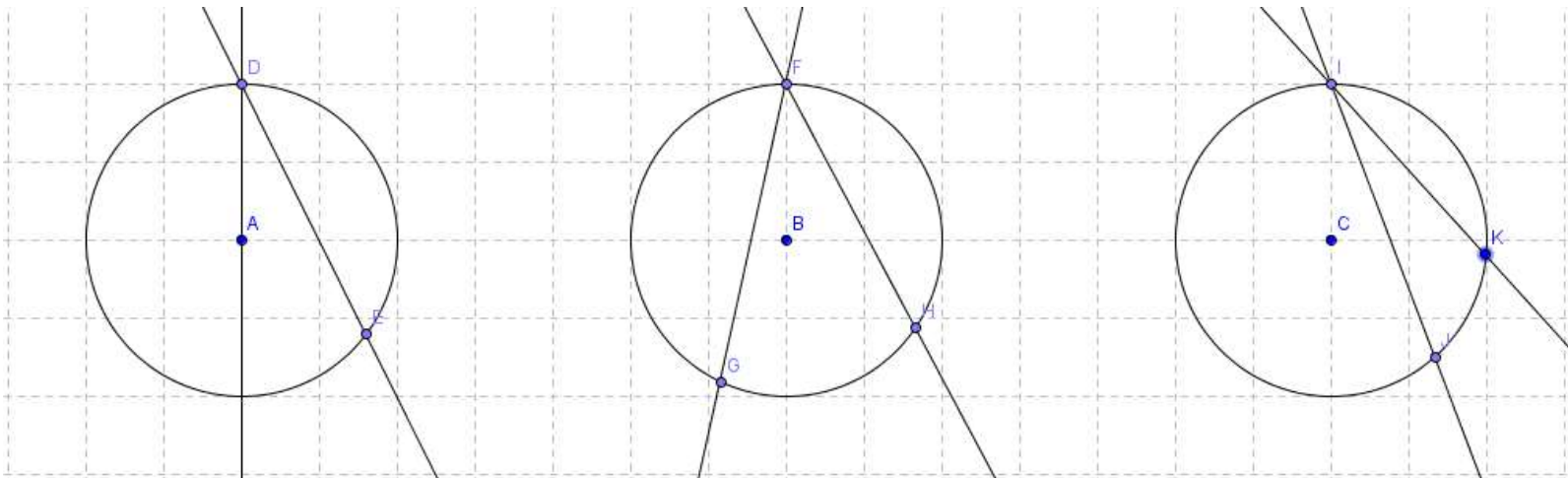
- Central angles (vertex is the center of the circumference)

Exercise: compute the measure of the angle of a radian.

- Two ways of **measuring** central angles:
 - Knowing the angle (not depending on the radius)
 - Knowing the longitude of the arc (depending on the radius)

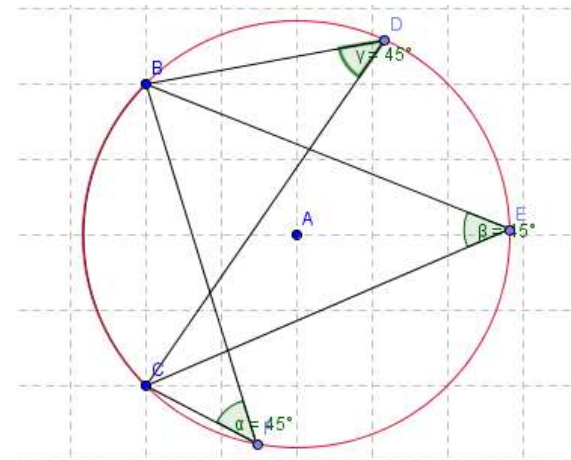
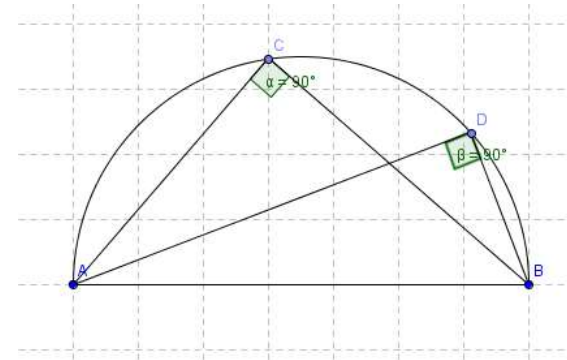
Angles in a circumference

- **Inscribed angles in a circumference:** angles with the vertex in a point of the circumference.
- **Theorem:** All inscribed angle measured the half of the the arc delimited by it sides. In other words, the measure of a inscribed angle is the half of the measure of the central angle associated.
- Proof:



Consequences

- All inscribed angle in a semicircumference is a right angle.
- All inscribed angle in the same arc are equal. (Example of angle in a goal in football)



Circumscribe poygons

- Circumscribe a polygon in a given circumference.
- Give a polygon and inscribe it on a circumfernece:
 - Triangle
 - Cuadrilateral

Inscribe polygons

- Inscribe a polygon in a given circumference.
- Give a polygon and inscribe it on a circumference:
 - Triangle
 - Cuadrilateral (only if a property is verified)